UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,405	12/28/2000	Stephan J. Jourdan	2207/7085	5261

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EXAMINER
LI, AIMEE J

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 03/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/749,405	JOURDAN ET AL.
	Examiner	Art Unit
	Aimee J Li	2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _28 December 2000 and 13 May 2002_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-27_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-27_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _23 April 2001_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _4_.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-27 have been considered.

Papers Submitted

2.   It is hereby acknowledged that the following papers have been received and placed of

record in the file: Declaration, Fee, and Drawing as received on 23 April 2001; IDS as received

on 23 April 2001; and Change of Address as received on 13 May 2002.

Drawings

3.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because

reference characters "10" and "12" have both been used to designate Decode in Figure 1. A

proposed drawing correction or corrected drawings are required in reply to the Office action to

avoid abandonment of the application. The objection to the drawings will not be held in

abeyance.

4.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because

reference character "10" has been used to designate both Decode and Execute in Figure 1 and the

pipeline on page 2, line 25. A proposed drawing correction or corrected drawings are required in

reply to the Office action to avoid abandonment of the application. The objection to the

drawings will not be held in abeyance.

5.   Figure 1 should be designated by a legend such as --Prior Art-- because only that which is

old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings

are required in reply to the Office action to avoid abandonment of the application. The objection

to the drawings will not be held in abeyance.

6.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they

do not include the following reference sign(s) mentioned in the description: Figure, element 14

on page 2, line 30. A proposed drawing correction or corrected drawings are required in reply to

the Office action to avoid abandonment of the application. The objection to the drawings will

not be held in abeyance.

Specification

7.   The following guidelines illustrate the preferred layout for the specification of a utility

application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include
the following sections in order. Each of the lettered items should appear in upper case, without
underlining or bold type, as a section heading. If no text follows the section heading, the phrase
"Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR
        DEVELOPMENT.
(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A
        COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program
        listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables
        having more than 50 pages of text are permitted to be submitted on compact
        discs.) or
        REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a).
        "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
(e) BACKGROUND OF THE INVENTION.
        (1) Field of the Invention.
        (2) Description of Related Art including information disclosed under 37 CFR 1.97
        and 1.98.
(f) BRIEF SUMMARY OF THE INVENTION.
(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(h) DETAILED DESCRIPTION OF THE INVENTION.
(i) CLAIM OR CLAIMS (commencing on a separate sheet).
(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

8.   Please add part (f) Brief Summary of the invention.

Claim Objections

9.   Claim 25 is objected to because of the following informalities: Please correct claim 25

"comprising *updatiing* a branch predictor" to read --comprising *updating* a branch predictor--.

The correction is highlighted in italics. Appropriate correction is required.

Claim Rejections - 35 USC § 102

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11.   Claims 1-7 and 9-23 are rejected under 35 U.S.C. 102(b) as being taught by McFarling et

al., U.S. Patent Number 5,758,142 (herein referred to as McFarling).

12.   Referring to claim 1, McFarling has taught a branch prediction apparatus, comprising:

   a.   A base misprediction history register (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8);

   b.   A meta predictor to receive an index value and a branch prediction to generate a misprediction value in accordance with said base misprediction history register (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8); and

    c.   A logic gate to receive said branch prediction and said misprediction value to

generate a final prediction (McFarling column 5, line 55 to column 6, line 64;

column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

13.   Referring to claim 2, McFarling has taught wherein said base misprediction history

register includes misprediction history data (McFarling column 5, line 55 to column 6, line 64;

column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

14.   Referring to claim 3, McFarling has taught further comprising an instruction that

provides said index value (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-

37; Figure 1; Figure 2; and Figure 8).

15.   Referring to claim 4, McFarling has taught wherein said instruction is a branch

instruction (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1;

Figure 2; and Figure 8).

16.   Referring to claim 5, McFarling has taught wherein said final prediction determines a

branch for said branch instruction (McFarling column 5, line 55 to column 6, line 64; column 10,

line 23-37; Figure 1; Figure 2; and Figure 8).

17.   Referring to claim 6, McFarling has taught further comprising a branch predictor that

receives said index value and generates said branch predictor (McFarling column 5, line 55 to

column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

18.   Referring to claim 7, McFarling has taught wherein said branch predictor utilizes a

prediction scheme to generate said branch prediction (McFarling column 5, line 55 to column 6,

line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

19.   Referring to claim 9, McFarling has taught wherein said base misprediction history register contains values of zero (0), and the misprediction value is not generated by said meta predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

20.   Referring to claim 10, McFarling has taught a method for predicting branches, comprising:

    a.   Receiving an index value, a branch prediction value correlating to said index value, and a misprediction history value at a meta predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8); and

    b.   Generating a misprediction value at said meta predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

21.   Referring to claim 11, McFarling has taught generating said branch prediction value at a branch predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

22.   Referring to claim 12, McFarling has taught receiving an index value at said branch predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

23.   Referring to claim 13, McFarling has taught generating a final prediction according to said branch prediction and said misprediction value (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

24.   Referring to claim 14, McFarling has taught determining a final value, and updating said

meta predictor and said base misprediction history register according to said final value

(McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2;

and Figure 8).

25.   Referring to claim 15, McFarling has taught wherein said updating includes comparing

said final value to said branch prediction (McFarling column 5, line 55 to column 6, line 64;

column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

26.   Referring to claim 16, McFarling has taught bypassing said meta predictor when said

misprediction history value contains all zeros (0) (McFarling column 5, line 55 to column 6, line

64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

27.   Referring to claim 17, McFarling has taught a processor, comprising:

    a.   A branch predictor to generate a branch prediction (McFarling column 5, line 55

        to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8);

    b.   A base misprediction history register (McFarling column 5, line 55 to column 6,

        line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8);

    c.   A meta predictor that receives an index value, said branch prediction and base

        misprediction history register data to generate a misprediction value (McFarling

        column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2;

        and Figure 8).

28.   Referring to claim 18, McFarling has taught a final prediction to correlate to said

misprediction value and said branch prediction value (McFarling column 5, line 55 to column 6,

line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

29. Referring to claim 19, McFarling has taught a logic gate to generate said final prediction (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

30. Referring to claim 20, McFarling has taught a computer readable medium having stored a plurality of executable instructions, the plurality of instructions comprising instructions to:

    a.   Receive an index value, a branch prediction value correlating to said index value, and a misprediction history value at a meta predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8); and

    b.   Generate a misprediction value at said meta predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

31. Referring to claim 21, McFarling has taught an instruction to generate said branch prediction value at a branch predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

32. Referring to claim 22, McFarling has taught an instruction to receive an index value at said branch predictor (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

33. Referring to claim 24, McFarling has taught an instruction to generate a final prediction according to said branch prediction and said misprediction value (McFarling column 5, line 55 to column 6, line 64; column 10, line 23-37; Figure 1; Figure 2; and Figure 8).

34. Claims 24-26 are rejected under 35 U.S.C. 102(b) as being taught by Tran, U.S. Patent Number 5,822,575 (herein referred to as Tran).

35.   Referring to claim 24, Tran has taught a method for restoring a branch prediction

apparatus following a branch misprediction of a branch instruction, comprising:

    a.   Restoring a base misprediction history register (Tran column 14, line 14 to

        column 15, line 7; column 18, lines 44-62column 19, lines 31-49; Figure 3; and

        Figure 4); and

    b.   Restoring a branch predictor history register (Tran column 14, line 14 to column

        15, line 7; column 18, lines 44-62column 19, lines 31-49; Figure 3; and Figure 4).

36.   Referring to claim 25, Tran has taught updating a branch predictor (Tran column 14, line

14 to column 15, line 7; column 18, lines 44-62column 19, lines 31-49; Figure 3; and Figure 4).

37.   Referring to claim 26, Tran has taught updating a meta predictor (Tran column 14, line

14 to column 15, line 7; column 18, lines 44-62column 19, lines 31-49; Figure 3; and Figure 4).

Claim Rejections - 35 USC § 103

38.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

39.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over McFarling et al.,

U.S. Patent Number 5,758,142 (herein referred to as McFarling), as applied to claim 1 above, in

view of Tran, U.S. Patent Number 5,822,575 (herein referred to as Tran). McFarling has not

taught wherein said branch predictor includes a target address field and a prediction table.

However, McFarling has taught that a prediction system is used (McFarling column 3, lines 27-

38; column 10, lines 23-37; and Figure 8). Tran has taught a branch prediction system wherein

said branch predictor includes a target address field and a prediction table (Tran column 19, lines

50-67; column 21, lines 19-50; Figure 8; and Figure 9). A person of ordinary skill in the art, and

as taught by Tran, would have recognized that the branch prediction system of Tran increases

prediction accuracy. Therefore, it would have been obvious to a person of ordinary skill in the

art at the time this invention was made to incorporate the branch prediction system of Tran in the

device of McFarling to increase prediction accuracy.

40.   Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tran, U.S. Patent

Number 5,822,575 (herein referred to as Tran), as applied to claim 24 above, in view of

Applicant's admitted prior art (herein referred to as Prior Art). Tran has not taught flushing an

instruction pipeline processing said branch instruction. Prior Art has taught flushing an

instruction pipeline processing said branch instruction (Prior Art page 2, lines 16-17). A person

of ordinary skill in the art at the time the invention was made would have recognized that

flushing the pipeline after a mispredicted branch eliminates incorrect instructions and data,

thereby ensuring the system is not contaminated with incorrect instructions and data. Therefore,

it would have been obvious to a person of ordinary skill in the art at the time this invention was

made to incorporate flushing the pipeline after a mispredicted branch of Prior Art in the device of

Tran.

Conclusion

41.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure as follows. Applicant is reminded that in amending in response to a rejection of

claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by

the references cited and the objections made. Applicant must also show how the amendments

avoid such references and objections. See 37 CFR § 1.111(c).

    a.   Pan et al., U.S. Patent Number 5,553,253, has taught a branch prediction system

          based upon a misprediction, index, and preliminary prediction.

    b.   Tran et al., U.S. Patent Number 5,954,816, has taught a branch prediction system

          based upon an index, preliminary prediction, and selection criteria.

    c.   Lempel, U.S. Patent Number 5,9578,909, has taught a branch prediction system

          based upon an index, preliminary prediction, and selection criteria.

    d.   Tran, U.S. Patent Number 5,995,749, has taught a branch prediction system based

          upon an index, preliminary prediction, and selection criteria.

    e.   Tran, U.S. Patent Number 6,253,316, has taught a branch prediction system based

          upon an index, preliminary prediction, and selection criteria.

    f.   Zuraski, Jr. et al., U.S. Patent Number 6,502,188, has taught a branch prediction

          system based upon an index, preliminary prediction, and selection criteria.

42.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Aimee J Li whose telephone number is (703) 305-7596. The

examiner can normally be reached on M-T 7:30am-5:00pm.

43.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

44.   Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL
Aimee J. Li
March 16, 2004

EDDIE CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100